DOCUMENT RESUME

ED 039 103 RE 002 720

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TITLE Relationships Between Readiness Characteristics and Primary Grade Reading Achievement in Four Types of Reading Programs.
PUB DATE Mar 70
NOTE 10p.; Paper presented at the conference of the American Educational Research Association, Minneapolis, Minn., Mar. 2-6, 1970

EDRS PRICE EDRS Price MF-$0.25 HC-$0.60
DESCRIPTORS Basic Reading, *Beginning Reading, *Grade 1, Grade 2, Initial Teaching Alphabet, Intelligence, Language Experience Approach, Phonics, *Predictive Ability (Testing), Reading Ability, *Reading Instruction, *Reading Readiness

ABSTRACT

The relationships between prereading measures of auditory discrimination, letter knowledge, and intelligence and reading ability were investigated for pupils who completed grades 1 and 2 in four different types of instructional programs--conventional basal reading programs, i/t/a programs, language-experience approaches, and code-emphasis programs. The 7,240 first-grade pupils and 3,036 second-grade pupils who comprised the sample for this study were participants in the Cooperative Research Program in First-Grade Reading Instruction. Pre-grade-1 measures were the Murphy-Durrell Phonemes test, the Murphy-Durrell Letter Names test, and the Pintner-Cunningham Primary Intelligence Test. The Paragraph Meaning and Word Reading subtests of the Stanford Achievement Battery were administered at the end of grades 1 and 2. In a majority of cases, significant differences were found among correlation coefficients representing predictive relationshps for pupils enrolled in different programs. The Letter Names test was the only measure which generally predicted reading ability in a similar fashion for the various programs. It was also found that each of the readiness measures was somewhat more effective in predicting reading success for pupils enrolled in code-emphasis and i/t/a programs than for pupils in basal and language-experience programs. Tables are included. (CM)

ED039103

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# RELATIONSHIPS BETWEEN READINESS CHARACTERISTICS AND PRIMARY GRADE READING ACHIEVEMENT IN FOUR TYPES OF READING PROGRAMS

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RE 002 720

This paper summarizes an investigation of relationships between prereading measures of auditory discrimination, letter knowledge, and intelligance and reading ability as measured by tests of word recognition and comprehension after one and two years of reading instruction. Predictive relationships were assessed separately for pupils enrolled in conventional basal reading programs, initial teaching alphabet materials, language experience approaches, and code-emphasis programs. The purpose of the study was to compare predictive validities of the three readiness measures for pupils enrolled in highly different types of instructional programs.

The pupils who comprised the sample for this investigation were participants in the Cooperative Research Program in First-Grade Reading Instruction. [1] Correlation coefficients used to assess relationships are based on data representing 7,240 first-grade pupils and 3,036 second-grade pupils. Exact numbers of pupils enrolled in the various types of instructional programs are reported in Tables 1 and 2.

## Descriptions of Reading Programs

Conventional basal programs in this study were characterized by: (1) control of vocabulary based on the frequency of use criterion with little or no attention paid to spelling patterns of the words introduced; (2) slow and easy introduction of vocabulary with extensive repetition of each new word; (3) delayed and gradual approach to phonic analysis; (4) emphasis from the beginning on reading for meaning; (5) early emphasis on silent reading; (6) emphasis from the beginning on utilization of a variety of word recognition clues including general configuration, structural analysis, picture clues, and context clues. It might be hypothesized that auditory discrimination and letter recognition would

[1] See Guy L. Bond and Robert Dykstra, "The Cooperative Research Program in First-Grade Reading Instruction" Reading Research Quarterly, 1967, 2 (4), 5-141 or Robert Dykstra, Continuation of the Coordinating Center for First-Grade Reading Instructional Programs. (Report of Project No. 6-1651) Minneapolis: University of Minnesota, 1967

be related to reading achievement in conventional basal programs to a lesser degree that in instructional programs which emphasize earlier and more intensive phonic analysis.

The i.t.a. (Initial Teaching Alphabet) programs used in this investigation were the Early-to-Read series published in the United States and the Downing Readers published in England. A relatively small proportion of pupils (approximately one-fifth of those in the study) were enrolled in classrooms using the Downing Readers. The chief distinguishing characteristic of i.t.a. programs, of course, is the unique 44-character alphabet for transcribing the sound of English, which makes possible more consistent correspondences between sounds and symbols. As a result of this greater regularity in sound-symbol correspondences, earlier and more intensive attention is given to phonic analysis of words than is true of conventional basal programs.

The language experience approach utilizes the child's own language as the medium for instruction in reading. Few,if any, materials are used in the beginning stages of instruction, and emphasis is placed on helping the child to see the relationship between his own speech and the written representation of his speech. Pupils learn to read by reading sentences and paragraphs they themselves have composed and reading is taught in the context of the total language program.

The fourth type of program involved in this study was a code-emphasis program which gives early and intensive attention to teaching the child to decode. Initial vocabulary is controlled on the basis of regularity of spelling pattern and phonic analysis is introduced early and treated extensively. Vocabulary is not only selected on the basis of different criteria that those used by authors of conventional basal materials, but it is introduced much more rapidly. Auditory discrimination would appear to be highly related to success in a program of this nature.

## Description of Tests

The readiness measure of auditory discrimination which was used in this investigation was the Murphy-Durrell Phonemes test, a measure of the pupil's ability to distinguish like and unlike beginning and ending consonants. Letter knowledge was measured by the Murphy-Durrell Letter Names test, a multiple-choice task which requires the pupil to identify both upper case and lower case letters. Intelligence was assessed at the beginning of grade one by means of the group-administered Pintner-Cunningham Primary Intelligence Test.

Reading achievement was measured by the Paragraph Meaning and Work Reading subtests of the Stanford Achievement Battery. Primary Battery I was used at the end of grade one and Primary Battery II was administered at the end of the second grade. The tests at each of the two grade levels are basically measures of comprehension and word recognition.

The tests of auditory discrimination, letter knowledge, and intelligence were administered in the first few weeks of school. Tests of reading ability were administered in the last few weeks of the school year.

## Results

Relationships between the three measures of readiness and first-grade reading achievement are reported in Table 1. Information is also provided regarding a test of the hypothesis that the correlation coefficients between each readiness measure and reading achievement are samples from a common population. The last column in Table 1 reports an estimate of the population value of r based on a weighted mean of the sample r's.[2]

Correlations between the test of auditory discrimination (the Phonemes test) and word recognition as measured by the Stanford Word Reading test were significantly

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[2]For an explanation of the statistical test see Allen Edwards, Experimental Design in Psychological Research (New York: Holt, Rinehart, and Winston, 1950) pp 133-136.

different from one another, ranging from a high of .59 for the code-emphasis programs to a low of .45 for the language experience program. Correlations were slightly higher for both phonic-emphasis programs than for the language experience and conventional basal approaches. The weighted average of the r's was .49.

Correlations between letter name knowledge and first-grade word recognition ability were more homogeneous among the four types of reading programs and differences did not reach the .01 level of significance. Coefficients of correlation ranged between .52 and .60 with a weighted mean of .56.

Significant differences were found among the four correlations between intelligence and word reading. Correlational relationships were somewhat higher for the i.t.a. and code-emphasis programs than for the conventional basal and language experience approaches. The average r was .46, somewhat lower than the mean correlations computed between first-grade word recognition ability and both letter knowledge and auditory discrimination.

The lower half of Table 1 reports correlation coefficients and chi square values concerning the relationships between the three readiness measures and the Stanford Paragraph Meaning Test. Significant differences among the sets of correlation coefficients were found for each of the predictors -- auditory discrimination, letter name knowledge, and intelligence. In each case relationships were somewhat greater within i.t.a. and code-emphasis programs, both of which emphasize early and relatively intensive phonic analysis. The best predictor of first-grade comprehension ability was the Letter Names test which had an average correlation of .53 with the criterion.

Similar relationships were examined at the end of the second grade, data for which are reported in Table 2. A cursory inspection of the table reveals that the correlation coefficients are of a somewhat smaller magnitude than those reported following one year of reading instruction. The predictors are now of

almost equal effectiveness in terms of second-grade word recognition ability, but letter name knowledge still is somewhat superior in predicting reading comprehension.

In terms of their relationships with word reading ability, the sets of correlation coefficients for the Phonemes Test and the Letter Names Test were not significantly different from one another. However, they did differ significantly for the intelligence test, where correlations ranged from .34 for the basal program to .50 for the i.t.a. program. In general, again all predictors were more effective for pupils in the code-emphasis and i.t.a. programs than for pupils enrolled in conventional basal and language experience programs.

With respect to the Paragraph Meaning variable, correlation coefficients differed significantly among themselves for the measures of auditory discrimination and intelligence. Substantial differences were found in the relationships between intelligence and reading comprehension ranging from a low of .34 for basal pupils to a high of .60 for pupils enrolled in the code-emphasis program. Correlations between letter name knowledge and reading comprehension ranged from .47 to .53 for the four types of reading programs and did not differ significantly from one another. Again each of the readiness measures was more highly related to reading achievement in the code-emphasis and i.t.a. programs than in the language experience and basal programs.

## Discussion

In a majority of cases significant differences were found among correlation coefficients representing predictive relationships for pupils enrolled in the four different types of beginning reading programs. The letter names test was the only readiness measure which generally predicted reading ability in a similar fashion for the various instructional programs. However, in most cases, the differences among correlation coefficients, although statistically significant,

were not of sufficient magnitude to encourage strongly the differential placement of pupils in reading programs based on performance on the tests of auditory discrimination, letter recognition, and intelligence.

It is more interesting to note, however, that each of the readiness measures was somewhat more effective in predicting reading success for pupils enrolled in code-emphasis and i.t.a. programs than for pupils in basal and language experience programs. This finding is most striking with respect to the intelligence test where correlations with reading varied considerably depending on the instructional program. A comparison of correlations for the code-emphasis and basal programs, for example, reveal differences between .56 and .44 for first grade word recognition, between .52 and .42 for first-grade reading comprehension, between .49 and .34 for second-grade word recognition, and between .60 and .34 for second-grade reading comprehension. It is possible that programs which introduce phonic skills and vocabulary more rapidly than do conventional basal materials permit the more mature child to move ahead in line with his ability, thereby increasing variability among pupils. Increased variability, of course, is associated with higher correlational relationships.

An interesting aspect of the study is the consistent relationship in all programs between letter knowledge and reading ability. In terms of the average correlation across all programs, letter name knowledge ranked first in its relationship to both first-grade and second-grade reading success. Also, in general, correlations involving letter name knowledge are consistent from one program to another. Whatever is measured by a simple test of letter recognition is consistently and considerably related to beginning reading achievement. This investigation lends additional support to the well-known general conclusion that letter name knowledge is highly related to success in initial reading. Considering the inconclusiveness of educational research the consistency of this finding is remarkable. Moreover, there is little to indicate that the effectiveness of

letter name knowledge as a predictor will decrease as a result of a trend toward a diversification of beginning reading programs. It is clear that children who can identify the letters of the alphabet prior to the beginning of reading instruction stand a good chance of learning how to read effectively regardless of whether they are enrolled in conventional basal, code-emphasis, i.t.a., or language experience programs.

TABLE 1

CORRELATIONS BETWEEN MEASURES OF READING READINESS AND FIRST-GRADE READING ACHIEVEMENT FOR FOUR TYPES OF READING PROGRAMS

| | BASAL (N=4266) | I.T.A. (N=1055) | Stanford Word Reading: LANG. EXP. (N=1431) | Stanford Word Reading: CODE EMPHASIS (N=488) | Chi Square (3 d.f.) | Ave. r |
|---|---|---|---|---|---|---|
| Murphy-Durrell Phonemes Test | .48 | .54 | .45 | .59 | 18.9* | .49 |
| Murphy-Durrell Letter Names | .55 | .60 | .52 | .57 | 8.60 | .56 |
| Pintner-Cunningham Primary Intelligence Test | .44 | .52 | .42 | .56 | 21.8* | .46 |
| **Stanford Paragraph Meaning** | | | | | | |
| Murphy-Durrell Phonemes Test | .46 | .53 | .41 | .57 | 24.3* | .47 |
| Murphy-Durrell Letter Names | .52 | .58 | .51 | .59 | 11.9* | .53 |
| Pintner-Cunningham Primary Intelligence Test | .42 | .52 | .43 | .52 | 21.2* | .44 |

*Significant at .01 level.

TABLE 2

CORRELATIONS BETWEEN MEASURES OF READING READINESS AND SECOND-GRADE READING ACHIEVEMENT FOR FOUR TYPES OF READING PROGRAMS

| | BASAL (N=1523) | I.T.A. (N=735) | Stanford Word Reading: LANG. EXP. (N=552) | Stanford Word Reading: CODE EMPHASIS (N=226) | Chi Square (3 d. f.) | Ave. r |
|---|---|---|---|---|---|---|
| Murphy-Durrell Phonemes Test | .42 | .49 | .38 | .48 | 7.2 | .44 |
| Murphy-Durrell Letter Names | .44 | .52 | .46 | .44 | 6.1 | .45 |
| Pintner-Cunningham Primary Intelligence Test | .34 | .50 | .47 | .49 | 23.8* | .42 |
| | | | Stanford Paragraph Meaning | | | |
| Murphy-Durrell Phonemes Test | .42 | .46 | .40 | .52 | 24.7* | .43 |
| Murphy-Durrell Letter Names | .47 | .53 | .48 | .50 | 3.3 | .49 |
| Pintner-Cunningham Primary Intelligence Test | .34 | .55 | .46 | .60 | 47.9* | .44 |

*Significant at .01 level.